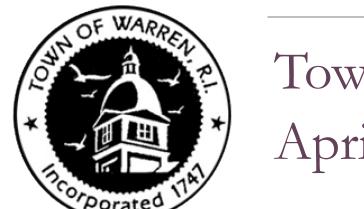


WASTEWATER TREATMENT FACILITY UPGRADES VALUE ENGINEERING RESULTS





Town Council Meeting April 25, 2016

**COMMITMENT & INTEGRITY DRIVE RESULTS** 

### Introduction

- Wright-Pierce Value Engineering (VE) Study was beneficial and adds value to the project
- A number of cost reduction measures have been identified
- Presentation Overview
  - Big Picture Themes
  - Value Engineering Approach
  - Most Significant Concepts





### **Big Picture Themes**

- Wright-Pierce presented several big picture themes:
  - Finite capital expenditure of \$20M
  - Woodard & Curran Facility Plan recommended plan is a reasonable approach
  - Reduce capital cost while meeting Town's objectives
  - Re-use existing infrastructure where applicable



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# Value Engineering Approach

- Wright-Pierce developed and presented concepts and opinions of cost
- Wright-Pierce recommends Woodard & Curran consider and determine which concepts should be evaluated and taken forward in the detailed design
- The Wright-Pierce Report presented a total of 37 concepts, as follows:
  - 18 categorized as recommended
  - 16 categorized as consider
  - 3 Wright-Pierce concepts are rejected by Wright-Pierce
- Of these Woodard & Curran is recommending that 15 concepts are evaluated further through the detailed design
- See summary table attached to the Woodard & Curran memo



### Concepts with Potential for Significant Impact

- Of the 37 Wright-Pierce Concepts, Woodard & Curran identified 4 major items for this presentation\*:
  - General Conditions Construction Duration
  - General Conditions Inflation
  - New Reactor Tanks for Nitrogen Removal
  - Sludge Handling Building

\* In the interest of time we selected the most significant items. We can review any or all 37 concepts if the Town Council chooses.



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### **General Conditions - Duration**

- Woodard & Curran based the 30% Design Cost Estimate on a 12 month construction duration
- Wright-Pierce recommended that planning for 21 to 24 months is more appropriate
- Woodard & Curran agrees 12 months is optimistic and it is more prudent to plan for 18 to 24 months
- Wright-Pierce estimated that the cost impact is \$626,000
- Woodard & Curran estimated that the cost impact is \$280,000 and does not recommend increasing the capital budget item b/c cost can be absorbed by:
  - the project contingency \$2.2M
  - conservative nature of the 30% design cost estimate
  - VE cost reduction measures



#### **General Conditions - Inflation**

- Wright-Pierce Report states:
  - General Contractors estimate a project assuming current labor rates, materials, etc.
  - To account for assumed increases in prices an inflation rate should be applied
- Wright-Pierce used an inflation rate of 3% to calculate a cost impact of \$1,000,000
- Woodard & Curran does not typically inflate 30% design cost estimates
- For comparison with the VE Report, Woodard & Curran used the Engineering News Record Construction Cost Index rate of 2%
- Woodard & Curran calculated a cost impact of \$390,000 and does not recommend increasing the capital budget item b/c cost can be absorbed by:
  - the project contingency \$2.2M
  - conservative nature of the 30% design cost estimate
  - VE cost reduction measures



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### New Reactor Tanks for Nitrogen Removal

- Wright-Pierce used a non-calibrated model which found the new reactor tank volume can be reduced by 50% (reduction of 25% of total existing and new reactor volume)
- Wright-Pierce estimates that this could save \$1,330,000
- Wright-Piece notes that the Wright-Pierce model was not based on historical process performance data
- Wright-Pierce recommends that Woodard & Curran review the process model to verify the required volume
- Woodard & Curran verified the 30% design volume by reviewing our calculations and model which are based on historical process performance data
- Woodard & Curran is recommending that the volume remain per the 30% design



### Sludge Handling Building

- Woodard & Curran 30% design includes a new Sludge Handling Building:
  - Existing Sludge Handling Building is from 1940s
  - Mechanical thickening and sludge storage are currently in the Operations Building basement
  - Causes corrosive environment, health hazards and is not compliant with current electrical code
- Wright-Pierce recommended an alternative approach:
  - Reduce excavation and new building construction
  - Utilize existing space in the Operations Building
  - Redistribute the proposed Sludge Handling Building functions:
    - Chemical storage
    - Gravity thickening
    - Sludge transfer pumps
    - Mechanical thickening and sludge storage



Woodard & Curran agrees but has a variation on the Wright-Pierce layout

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# Wright-Pierce Sludge Handling Layout

- Chemical storage –in new building constructed above the existing Chlorine Contact Tank
- Gravity thickening selective demo of existing sludge building leaving only the foundation. Construct new gravity thickening tanks inside the foundation
- Sludge Transfer Pumps installed inside the existing sludge building foundation
- Mechanical thickening and sludge storage install in the Operations Building
- Wright-Pierce estimated the cost savings is \$750,000



### Woodard & Curran Sludge Handling Layout

- Chemical storage some chemicals in the Operations Building, some in a new slab-on grade building
- Gravity Thickening new structure located next to the Operations Building
- Sludge Transfer Pumps located in the Operations Building
- Mechanical thickening and storage new structure located next to the Operations Building
- Woodard & Curran estimated the cost savings is \$200,000



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# Summary

- The Wright-Pierce Value Engineering Analysis:
  - Considered overall intent of project
  - Reviewed several major facilities
  - Provided concepts for Woodard & Curran to consider
- The Wright-Pierce Report includes:
  - 18 recommended concepts at \$1.5M savings
  - 16 consider concepts at \$1.0M savings
  - Total potential savings of \$2.5M
  - Refer to Table 3-1
- Woodard & Curran recommends further evaluation of 15 concepts to be carried forward in the final design



